

## ABSTRACT

The present invention provides method and apparatus for surface treatment which, when employed in process steps of manufacturing semiconductor devices, can result in the final products having enhanced reliability. According to the surface processing method, an object to be processed W is introduced in a processing vessel 10, which is then supplied with  $\text{ClF}_3$  gas serving as cleaning gas from a supply unit 26. The  $\text{ClF}_3$  gas is bound to the surface of the object to be processed W, and although the supply of the gas to the processing vessel is interrupted, the  $\text{ClF}_3$  gas bound to the surface of the object to be processed W serves to clean the surface of the object to be processed. Next, reducing gas is introduced into the processing vessel W to remove chlorine from the object to be processed W, the chlorine being derived from the  $\text{ClF}_3$  gas. After that, the introduction of the reducing gas is interrupted, and the cleaned object to be processed W is exported from the processing vessel 10. In addition to that, a surface processing apparatus 1 and other processing devices are arranged in a cluster device so that an object to be processed therein is transported among them from one to another under a vacuum environment.